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An Essay on the Meaning of Scientific Method

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by

MORRIS R. COHEN

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TO MR. JUSTICE OLIVER WENDELL HOLMES

The Courageous Thinker and Loyal Friend

Preface

THE distinctive intellectual traits of Western civilization, or of what is sometimes called the modern mind, have been largely moulded by the appeal to nature against conventional taboos and by the appeal to reason against arbitrary authority. That nature and reason, like warmth and light, may be intimately joined was made evident in the Hellenic ideal of science as a free inquiry into nature and of ethics as concerned with a rational plan for attaining the natural goods of life. Unfortunately for the career of liberal civilization, however, various circumstances have brought about a mutual hostility between these two appeals to what are popularly called the heart and the mind. The appeal to nature is frequently a form of sentimental irrationalism, and the appeal to reason is often a call to suppress nature in the interest of conventional supernaturalism. To understand fully the grounds, causes, and effects of this conflict would involve a thorough survey of contemporary civilization and carry us far into the complexity of the human mind. One of the elements, however, in such a survey is a right understanding of the general bearing or meaning of scientific method, i.e., of the principles of procedure according to which scientific results are obtained and according to which these results are being constantly revised. In developed natural science, reason and nature are happily united.

Such a study of the principles of science I began some twenty years ago. Untoward circumstances have prevented the continuous toil necessary for such a task. Different parts of this work have been written at widely different times and in somewhat different keys. But the favourable reception accorded to those portions of it which have been published from time to time, and the insistence of friends whose judgment compels respect, induce me somewhat reluctantly to publish the present essay rather than wait any longer for the completion of a more satisfactory systematic treatise. I am induced to do this not only by a sense of the

inherent importance of the issues I have faced but also by my conviction that the present state of philosophy is especially in need of the method of approach here represented.

There are many indications of a widespread dissatisfaction with the arid state of present-day technical philosophy. Seldom before has the general craving for philosophic light seemed so vast and the offerings of professed philosophers so scant and unsubstantial. Some there are who attribute this poverty to the preoccupation of professional philosophers with the technical problems of epistemology, e.g. how the mind can know a supposedly external world. It has been justly urged that this baffling and strangely fascinating problem has in fact never thrown much light on the nature of any of the great objects of our vital interests, though subjectivist solutions of it have often been used to support traditional views and evaluations. We may grant this without denying that the concentration on the technical problems of epistemology arose out of a well-justified dissatisfaction with the older romantic fashion according to which every philosopher was expected to spin a new view of the universe out of his inner consciousness, or else confirm in a new and strange manner the old familiar views. The critical question, "How do we know?" is a much-needed challenge to those who complacently claim to have solved all the enigmas of existence. Yet the main motive for epistemology is professional. As teachers of philosophy see their colleagues gaining prestige through contributions in special technical fields, they are tempted to take the position: "We too are specialists. We too have a definite technical field of our own, to wit: the nature of knowledge as such." But alas! The ideal of technical competency is not without its snares. A good deal of the unsubstantiality of later scholasticism was no doubt due to the fact that having elaborated a very subtle technical vocabulary, men felt themselves to be distinguished scholars by the mere mastery of such a vocabulary. The change from Latin to the vernacular revealed this emptiness and compelled a greater attention to substantial content. But this gain is now largely frittered away in philosophy and in the related fields of psychology and sociology, in which exercises in technical vocabulary frequently hide the paucity of substantial insight.

Meanwhile, the ancient need of a more or less integrated view of the

general panorama of life and existence has shown itself to be too deep to be permanently neglected. New voices have arisen urging philosophy to become again constructive and to cease to lose itself in historical, philologic, and other technical minutiae. There can be little doubt that the philosophic writers of recent days who have most stirred men's imaginations and found the greatest popular response have been of this character, witness James, Bergson, Croce, and Spengler.

Can those who have a sober knowledge of the many failures of previous romantically "constructive" philosophies entertain a naïve and unquestioning hope in these new efforts? This is especially difficult for those who know something about physical science and who cannot agree to banish its solid theoretic achievements as merely practical devices devoid of philosophic value. Doubtless philosophy will long continue to represent interests wider than those of rigidly demonstrative science. Philosophy is primarily a vision and all great philosophers have something in common with the poets and prophets. But while vision, intuition, or wisdom is the substance of any philosophy that is worth while, serious philosophy must also be something more than a poetic image or prophecy. It must, like science, be also vitally concerned with reasoned or logically demonstrable truth. Granted that great truths begin as poetic or prophetic insights, it still remains true that the views of poets and prophets have in fact often proved narrowly one-sided, conflicting, incoherent, and illusory. To introduce order and consistency into our vision, to remove pleasing but illusory plausibilities by contrasting various views with their possible alternatives, and to judge critically all pretended proofs in the light of the most rigorously logical rules of evidence, is the indispensable task of any serious philosophy. The seed which ripens into vision may be a gift of the gods but the labour of cultivating it so that it may bear nourishing fruit is the indispensable function of arduous scientific technique.

If these considerations are in any way sound, philosophy can hope to be genuinely fruitful only by being more scientifically critical or cautious than the recent romantic efforts, and at the same time more daring and substantial than those microscopic philosophies which lose sight of the macrocosm. This can be brought about only by intimately confronting the great classical views of the world at the heart of the great humanistic

tradition with the painfully critical methods by which the natural sciences have built up their great cosmic vistas.

In turning to the sciences I emphasize their method rather than their results. For, in an age of scientific expansion, not only are the methods the more permanent features of the sciences, but the supposed results are often merely popularized conventions, utterly misleading to all those who do not know the processes by which they are obtained. The life of science is in exploration and in the weighing of evidence. Dead or detached results lend themselves to the mythology of popular science, and ignorance of method leads to the view of science as a new set of dogmas to be accepted on the authority of a new set of priests called scientists. It is doubtless impossible for any single individual to be a trained investigator in all the different fields upon which philosophy touches. It may also be urged that too great devotion to rigorous scientific evidence may narrow our sympathies and prevent us from dealing justly with those vital interests which science has not yet been able to organize. But the difficulty and the dangers of our task cannot prevent it from being indispensable in any case. All that is absolutely worth while has something of the unattainable about it. No faith can live today in anything but a fool's paradise unless it ventures out into the high and open but biting air of critical reason as natural science does.

Greater regard for the rational methods of natural science must be joined with a more serious concern with the great historic traditions in philosophy. Sound logic and the history of science unite to show that an adequately critical appreciation of the reported facts in any realm depends on a knowledge of the hitherto prevailing views which condition what we shall regard as facts.

Moreover to take adequate cognizance of those views which have in fact proved influential is a powerful protection against the temptation to triumphantly exploit one's own views in a narrowly partial and one-sided manner. The notion that we can dismiss the views of all previous thinkers surely leaves no basis for the hope that our own work will prove of any value to others.

The philosopher whose primary interest is to attain as much truth as possible must put aside as a snare the effort at originality. Indeed, it seems to me that the modern penchant for novelty in philosophy is symptomatic of restlessness or low intellectual vitality. At the same time

I should not make this book public if I did not hope that thoughtful readers will find its ideas timely, worthy of consideration, and capable of extension. Particular attention is directed to the principle of polarity, the principle that opposite categories like identity and difference, rest and motion, individuality and universality, etc., must always be kept together though never identified. Whatever the inadequacies of my formulation and application of this principle, I am sure that by a more persistent use of it many of the traditional controversies of philosophy can be eliminated, or at least shown to be inadequately stated. The principle of polarity calls attention to the fact that the traditional dilemmas, on which people have for a long time taken opposite stands, generally rest on difficulties rather than real contradictions, and that positive gains in philosophy can be made not by simply trying to prove that one side or the other is the truth, but by trying to get at the difficulty and determining in what respect and to what extent each side is justified. This may deprive our results of sweep and popular glamour, but will achieve the more permanent satisfaction of truth.

While speculations about the future of civilization and philosophy must in the nature of the case be very uncertain, all evidence seems to indicate that in the rhythmic alternation of periods of expansion and consolidation which characterize the life of civilization, different sets of categories are emphasized. Thus the mediaeval mind was dominated by the demand for order in our thought as well as in the world at large. Faced with the centrifugal tendencies due to the pressure of population against the bounds of a fixed land economy, and faced with the doubts as to the traditional theology that resulted from contact with Saracen civilization, the mediaeval mind found in the scholastic method of drawing distinctions a way of introducing order and reconciling conflicting views. It did so by trying to assign to everything its just realm. This method of scholasticism, originated by Abelard in his *Sic et Non*, independently embodied in Gratian's great work on Canon Law, and perfected by St. Thomas in his Summa, rests ultimately on the axiom of Aristotelian logic that opposites cannot be identical, illustrated in Kipling's maxim, "East is East and West is West." The wise or good man, on this view, will draw and respect the proper boundaries between them.

Modern thought, i.e. the thought since the middle of the fifteenth century, has been operating in what has in the main been an expanding

economy. The opening of new lands and new methods of production have made the idea of movement or growth the dominant one in the internal as well as in the external world. But the idea of change involves some continuity between opposites. The first modern man who saw this both in mathematics and philosophy was the great Cardinal Cusa, whose doctrine of the coincidence of opposites marks the beginning of modern kinetic views of the world which terminate in nineteenth century Hegelianism and evolutionism. Modern thought emphasizes mobility and the principle that everything changes to something else and must indeed become something other than it was in order to exhibit its true character. The nature of things unfolds itself in time.

There are, however, signs that this period of expansion is about to close. Despite the steady progress of science, Europe seems already to have reached the maximum population that it can support, and the opportunities of exploiting other parts of the world by migration or conquest seem steadily decreasing. Within measurable time, then, the whole earth will become fully explored and the limits of its food and other resources may be definitely attained. The dominant values of life must then become somewhat similar to those of mediaeval and Chinese society—greater stress on order than on expansion. Indeed, already the popular demand is for the organization of knowledge rather than for its expansion. But whatever the future may bring, it is clear that any attempt to see the limitation of the characteristically modern emphasis on the "dynamic," the "evolutionary," and the "progressive" must pay greater attention to the principle of polarity as the union of the values of order and stability with the values of change and progess. Because of these considerations I am confident that no matter how inadequate the results of the studies here published, no just criticism, not even the withering refutation of time, will prove the effort itself to be in the wrong direction.

To readers who have a predilection for conventional labels, I offer the following:

I am a rationalist in believing that reason is a genuine and significant phase of nature; but I am an irrationalist in insisting that nature contains more than reason. I am a mystic in holding that all words point to a realm of being deeper and wider than the words themselves. But I reject as vicious obscurantism all efforts to describe the indescribable.

I reject the euthanàsia or suicide of thought involved in all monisms which identify the whole totality of things with matter, mind, or any other element in it. But I also reject the common dualism which conceives *the* mind and *the* external world as confronting each other like two mutually exclusive spatial bodies. I believe in the Aristotelian distinction between matter and form. But I am willing to be called a materialist if that means one who disbelieves in disembodied spirits; and I should refer to spiritists who localize disembodied spirits in space as crypto-materialists. However, I should also call myself an idealist, not in the perverse modern sense which applies that term to nominalists like Berkeley who reject real ideas, but in the Platonic sense according to which ideas, ideals, or abstract universals are the conditions of real existence, and not mere fictions of the human mind.

To those who labour under the necessity of passing judgment on this book in terms of current values, I suggest the following:

The author seems out of touch with everything modern and useful, and yet makes no whole-hearted plea for the old. He believes in chance and spontaneity in physics and law and mechanism in life. He has no respect for *experience, induction, the dynamic, evolution, progress, behaviourism* and *psychoanalysis,* and does not line up with either the orthodox or revolutionary party in politics, morals, or religion, though he writes on these themes. He offers no practical message to the man engaged in the affairs of life, and seems to be satisfied with purely contemplative surveys of existence.

But to the thoughtful reader I can offer as a preliminary only the expression of my profound faith in philosophy itself. The task of philosophy is too complicated to be solved by simple magical formulae. The age of panaceas, nostrums, and philosopher's stones belongs to the adolescence of philosophy. In its maturer period, it must, like science and rational industry, depend upon more modest and workmanlike efforts, though it can never abandon the search for comprehensive vision. We cannot by reasoning achieve absolute certainties as to matters of fact. But we may clarify our minds as to the rational strength of the evidence for our convictions. We shall never overcome the infinite sea of ignorance, and we should remember that if ignorance were bliss, this would be a much happier world than it is. Let not philosophy, therefore, deal in false comforts or gratify those who crave from it confirmation of es-

tablished prejudices. It has a far higher function,—to give men strength to envisage the truth. Vision is itself a good greater than the perpetual motion without any definite direction which modernists regard as the blessed life. Cosmic vision ennobles the pathetic futility of our daily crucifixions. But all philosophy is blasphemous if it denies to the gods a sense of humour or the gift of laughter.

One who ranges over as wide a field as that involved in the present volume cannot hope to escape detectable errors. I should, however, add that where my views differ from those of well-known authorities it is not always because of my ignorance as to what these authorities maintain. I have taken pains to familiarize myself directly with the views of the great classical philosophers and with the scientific researches on which my generalizations as to scientific methods are based, but I have not tried to escape responsibility for my own judgment.

I have not been at all impressed by the religious and philosophic lessons drawn from science by men like Millikan, Eddington, Coulter, A. H. Compton, E. G. Conklin, and the like. I respect, as every one must, the great achievements of these distinguished workers in their special fields. But scientists do not always carry scientific method into their views of manners, morals, or politics, of justice between nations or social classes, of the reliability of mediums, etc. Neither are they scientific when they make their professional work a springboard from which to jump off into amateurish speculative flights in the fields of religion and philosophy.

I have in the substance and manner of this book tried to reach thoughtful readers irrespective of their previous philosophic studies and have therefore avoided technical terms as far as was consistent with substantial accuracy. Indeed I have used some technical terms of logic in their popular sense, trusting the context to make my meaning clear. It is difficult to know how much of the factual content of science to take for granted. No two readers are exactly alike in this respect, but I have addressed myself to the generally educated public that is not afraid of close and sustained reflection. Some of the chapters, notably the third of Book I, require more effort in that direction than others. But the reader may skip some chapters or change the order of reading them. Though they are all parts of an integral thesis, they were written at different times and have a certain relative independence of each other.

It is the pleasant privilege of the author of a book, no matter what its achievement, to acknowledge his obligations. This permits me to associate this volume with the great names of my teachers, Josiah Royce and William James—unfortunately no longer with us—and with the names of G. H. Palmer, Felix Adler, F. J. E. Woodbridge, C. A. Strong, and W. H. Sheldon, among the living. If I have succeeded in indicating the genuine interplay of practical issues and theoretic philosophy the credit is largely due to encouragement in that direction from Professor Adler. If I have succeeded in maintaining the need for the classical spirit of discrimination in philosophy, the reader is indebted to Professor Woodbridge, whose seminar in Aristotle was my first regular academic course in philosophy. To Professors Woodbridge and Bush, as editors of the *Journal of Philosophy*, I am also indebted for their kind encouragement to publish most of my papers that were read before the American Philosophical Association or the Philosophical Club of New York.

My debt to George Santayana's *Life of Reason* might have been much greater if I had not arrived at my fundamental positions by a road which I imagine to be altogether different from his own. Only after the essentials of this book were worked out in my own mind did I begin to appreciate the profound insight with which naturalism and spirituality are united in the latter parts of the *Life of Reason*. I mention this not for the sake of any vain claims to originality but in the hope that my readers may be led to a greater appreciation of the richest philosophic classic produced on this side of the Atlantic. To Bertrand Russell's *Principles of Mathematics* I owe the greatest of all debts,—it helped me to forge the instruments for acquiring intellectual independence.

Last I must mention that the philosophic studies of which this book is an expression would probably have been impossible if it were not that in dark and dispiriting hours I was helped by the sustaining friendship first of Thomas Davidson, William T. Harris, and Janet E. Ruutz-Rees—would I had something worthier to offer on the altar of their memory!—and later of Arthur S. Meyer, Felix Frankfurter, Dr. A. A. Himwich, and a life-long companion of an understanding heart whose modesty prevents a more explicit reference. I should be derelict if I did not also acknowledge my indebtedness to Mr. and Mrs. Osmond K. Fraenkel and to Mrs. Edward MacDowell, the inspiring leader of the

MacDowell Colony at Peterborough, N. H., for opportunities to do the actual writing of a large part of this book. Mr. Fraenkel has also increased my obligations to him by reading the book in manuscript. My son, Dr. Felix S. Cohen, has been so helpful in suggestions, criticisms, and preparing the manuscript for the press, that I find it difficult to indicate the great extent of my—and the reader's—obligation to him.

In dedicating this book to Justice Holmes I wish to indicate not only my reverence and affection for him personally but also the fact that I have not forgotten the others who ten years ago were associated with him in a venture which heartened me more than I can readily express.

Contents

BOOK I. REASON AND THE NATURE OF THINGS

BOOK II. REASON IN NATURAL SCIENCE

CONTENTS

Book I

REASON AND THE NATURE OF THINGS

Chapter One

THE INSURGENCE AGAINST REASON[1]

DESPITE the frequent assertion that ours is the age of science, we are witnessing today a remarkably widespread decline of the prestige of intellect and reason. Though the most successful of our modern sciences, the various branches of mathematics, physics, and experimental biology, have admittedly been built up by intellectual or rational methods, "intellectualistic" and "rationalistic" are popular terms of opprobrium. Even among professed philosophers, the high priests of the sanctuary of reason, faith in rational or demonstrative science is systematically being minimized in the interests of "practical" idealism, vitalism, humanism, intuitionism, and other forms of avowed anti-intellectualism. A striking instance of this is William James' attack, in his *Pluralistic Universe*, on the whole enterprise of intellectual logic, in the interest of Bergsonian intuitionism and Fechner's mythologic speculations about the earth-spirit.

There can be little doubt that this distrust of reason has its roots deep in the dominant temper of our age, an age whose feverish restlessness makes it impatiently out of tune with the slow rhythm of deliberate order. The art, literature, and politics of Europe and of our own country show an ever-growing contempt for ideas and form. The popular philosophies of the day, those which emanate from James, Bergson, Croce, Nietzsche, Chamberlain, Spengler, and others, are certainly at one with the recent novel, drama, music, painting, and sculpture in attaching greater value to novel impressions and vehement expression than to coherency and order. The romantic or "Dionysiac" contempt for prudence and deliberative (so-called bourgeois) morality is a crude expression of the same reaction against scientific or rigorous intellectual procedure,—a reaction which makes our modern illuminati like Bergson and Croce dismiss physical science as devoid of

[1] The substance of the present chapter was printed in the *Journal of Philosophy*, Vol. XXII (1925), p. 113.

any genuine knowledge, or as at best a merely practical device for manipulating dead things. It would preposterously exaggerate the actual influence of philosophy if the outrageously shameless contempt for truth shown in the various forms of recent propaganda were attributed to the systematic scorn heaped by modernistic philosophies on the old ideal of the pursuit of truth for its own sake "in scorn of consequences." Yet this decline of respect for truth in public or national affairs is certainly not devoid of all significant connection with its decline in philosophy and art.

Is it far-fetched to correlate the distrust of intellectual procedure (and consequent revival of all sorts of ancient superstitions) with the growing bigotry, intolerance, and remarkable resurgence of faith in violence? Violence is certainly no new phenomenon in human affairs. But avowed faith in violence has seldom before raised its head so high among educated men, or led them to such contempt for free parliamentary discussion, and to such readiness to suppress contrary opinion by arbitrary force and dictatorial power. From Moscow to the Mediterranean there reigns a pathetic faith in salvation through brutality. Nor is this entirely the result of the war. Even before the war, unabashed faith in violence showed itself in such diverse movements as nationalism and syndicalism and in such incidents as the organized Tory riot in the British House of Commons.

This decline in the popular prestige of the appeal to presumably universal reason is naturally associated with the growing contempt for the ideal of humanity professed in the days of the rationalistic enlightenment by men like Voltaire, Lessing, Diderot, Kant, Condorcet, Thomas Paine and Goethe. The new philosophies of "sacred" national egoism put temporary, local, or racial interests so high as to hold in contempt the common life of humanity.

In thus calling attention to the connection between anti-rationalism and the violent temper of our age, I have no desire to cry: Woe is us, we have fallen on evil days! Nor do I think that all the new popular philosophies can justly be dismissed by simply being thrown together in bad company—no more than their truth can be established by sweeping unhistorical claims to novelty, or by indiscriminate rejection of all previous philosophy. I wish merely to call attention to the fact that

the issues of rationalism have all sorts of vital backgrounds and bearings.

Current anti-rationalism endeavours to soften its opposition to rigorous logical procedure by representing modern science as empirical rather than rational. But without reasoning, as the process of drawing logical inferences, there is no science. We may grant this without prejudging the claims of mystic vision, intuition, or higher non-rational illumination. The proper relation between the rational and empirical elements in science will occupy our attention later. Here it is sufficient to note that none of the great founders of modern science felt any opposition between the rational (mathematical or logical) and the empirical (or experimental) elements in their procedure. Literary historians and philosophers, unacquainted with the actual scientific work of men like Harvey, Kepler, Galileo, Descartes, and Newton, have been misled in this respect by Bacon, and by some polemic passages in the more popular works of Galileo and Descartes. But Bacon was certainly not himself a scientist and the great scientific achievements of Galileo and Descartes were thoroughly mathematical and rationalistic.

A just historical perspective of the relation between rationalism and naturalism—at least before the nineteenth century—views them as necessary allies in the war of emancipation from what many like Goethe regarded as the essence of mediaevalism, namely, the view that nature is sin and intellect the devil. The appeal to reason was a favourite weapon against superstitions and needlessly cruel restraints on natural life. The great enemy of rationalism was, therefore, not empiricism, but some form of non-rational authoritarianism, generally supernatural. Thus in religion, rationalism in the form of deism was opposed to special revelation, to miracles, and to special interventions of the deity in behalf of privileged people. In politics and economics, rationalism challenged the established privileges and monopolies to justify themselves at the bar of common human interests. So in science rationalism opposed the traditionally authoritative view of the world, as well as popular credulity in the strange, the marvellous, and the magical. Thus it was the intimate union of rationalism and naturalism which, through men like Kepler, Galileo, Campanella, Spinoza, Grotius, Leibniz, Newton, Beccaria, and the Encyclopaedists, liberated science from the tutelage of theology, overthrew the Inquisition, prepared the way for

a notable humanization of our treatment of the criminal, the sick, and the insane, and liberalized civil and international law. The framers of the American Declaration of Independence and the French Declaration of the Rights of Man appealed so confidently to reason that their age may be referred to as the Age of Reason. It is in the subsequent eclipse of the prestige of reason, following the French Revolution and the excesses of the romantic *Naturphilosophie,* that the opposition between empiricism and rationalism came to be prominently emphasized.

The decline of the avowed faith in reason is thus one of the central facts of recent intellectual history. To attribute it to the reaction due to fright at the violence of the French Revolution and to the stirring up of the national passions by the ensuing wars, is but part of the truth. More is needed to explain the persistent effects of that reaction, and the relative weakness of the liberal rationalistic forces, which, under the aegis of natural science, seemed about to prevail in the middle of the nineteenth century. One who owes no allegiance to the democratic dogma may well associate the decline of rationalism with the decline of aristocracy, or to put it more paradoxically: reason lost ground because of the spread of literacy. For, by removing the political and economic restraints which had kept the multitude from the realm of education, the Industrial Revolution and its political consequences let loose a horde of barbarians for the invasion of the fields of intellectual culture that had hitherto been restricted to those elaborately trained or specially gifted. The spread of literacy, without the prolonged discipline on which aristocracies must depend for the maintenance of their powers and privileges, diluted the intellectual life and brought about a flabby popularity not conducive to rigorous reason. Few can talk sensibly and accurately when they raise their voices high to address very large audiences; and newspapers which seek to attract vast multitudes of readers must adopt an admittedly low intellectual level. These and other courtiers of King Demos dare not remind him that despite modern "outlines," "stories," and other pretended short-cuts to omniscience, there is still no easy royal road to real knowledge. Why, indeed, bother about any road at all when the ability of every citizen to settle all sorts of issues (provided he votes with the prevailing plurality) is sanctified by the motto, *vox populi vox dei?*

These reflections may seem offensive, and they have obvious limita-

tions. They certainly do not take account of certain great gains, even in the intellectual realm, brought about by the democratic movement, e.g. increased respect for hitherto undignified facts. Yet they certainly contain a measure of truth. While some rationality is latent in all conscious life, the clear perception and grasp of its principles is involved in great difficulty so that at all times only a few reach the heights. In any case it is unquestionably true that, previous to the nineteenth century, education, according to the Greek model of rational self-control, was the privilege of the few. Even Rousseau thought of education in terms of one who could have a private tutor accompany him all the time. When schools have to teach large classes, and students must be promoted and graduated en masse in order to make room for newcomers, insistence on the attainment of intellectual standards becomes in fact increasingly difficult. The spread of popular education, the bringing of the matter of education down to a level where every one can reach it, has certainly not been directed to emphasize the prolonged discipline which is necessary for the proper exercise of reason. Moreover, increase of knowledge is not necessarily the same as increase of rationality. Indeed the decline of respect for reason may also in part be due to the unprecedented growth of factual knowledge brought about by the amazing discoveries of new peoples, new historic epochs, and new fields of nature—all of which discoveries have been facilitated by improved means of travel, communication, etc. The first result of all this progress has been to produce an impression of bewildering factual diversity and to weaken the sense of rationality or logical connection of nature as a whole. Scepticism and philomathia thus replace philosophia.

Let us, however, pass from speculations as to historical causes and consider the force of the arguments actually advanced against the indispensable rôle of rational thought in the attainment of truth. These may be grouped under four main heads: (1) the psychological, (2) the historical, (3) the empirical, and (4) the kinetic.

§ I. THE ARGUMENT OF PSYCHOLOGISM

THE first and the most widespread of these arguments is the psychological one. The most popular version of it may be stated as follows: The old rationalism absurdly overemphasized the power of conscious reasons as motives. For instance, it thought of law and religion as the conscious invention of some legislator or priest. The sentiment that

> Courts for cowards were erected,
> Churches built to please the priests

may not have been typically respectable, but all classes, Tories as well as revolutionists, appealed to the terms of the social contract by which human society was supposed to have been instituted. Not only the state and the family, but even language, was regarded as instituted by conscious convention.[2]

Against this, the romantic movement since Schlegel, Schelling, and Savigny has insisted that human institutions are matters of growth rather than creation, and that the great achievements of life are the result of unconscious spirit rather than conscious deliberation. Even Hegel, despite or because of his extravagant panlogism, has so emphasized the immanent necessary evolution (or dialectic) at the basis of human history, politics, religion, art, and philosophy as to leave nothing to conscious human effort.

It cannot well be denied that the roots of our conscious being are in a dark soil where the light of deliberate reflection does not directly penetrate. But this does not deny the reality or diminish the unique worth of the light. Furthermore, this argument certainly does not justify the romantic moral that we should trust all our "unconscious" promptings. For the latter are often conflicting and sometimes self-destructive, and none of the specifically human values which we call civilization are independent of long and painful conscious effort. Plants that have their

[2] See Hobbes, *Opera*, Vol. I, p. 14, Vol. II, p. 90; *Leviathan*, Pt. I, Ch. 4; Condillac, *Sur l'origine des connaissances humaines* (1746), Vol. II, § 1; Rousseau, *Sur l'inégalité*, *Œuvres* (1790), Vol. VII, pp. 80 ff.; Monboddo, *Of the Origin and Progress of Language* (2nd ed., 1774), especially p. viii and Bk. II, Chs. 6 and 7. Both Rousseau and Lord Monboddo are aware of difficulties, yet still speak of language as an invention, just as Democritus, Epicurus, and Lucretius did.

roots in the dark soil depend no less on the rain and the sunshine from above. The romantic effort to enthrone Dionysius and the chthonic deities has always proved worse than sterile when it has meant the banishing of the Olympic gods of the air and the light. Inspiration or Dionysiac frenzy is barren or destructive except when it submits to rational labour. For not all who rave are divinely inspired.

There is doubtless a certain superficial truth in the anti-rational psychology which maintains that reason is cold and lifeless and an irksome restraint on the creative imagination. But the oft-quoted lines,

> Grau . . . ist alle Theorie,
> Und grün des Lebens goldner Baum,

express not the judgment of Goethe, but a dictum of Mephistopheles, whose motive is revealed in a preceding passage:

> Verachte nur Vernunft und Wissenschaft,
> Des Menschen allerhöchste Kraft, . . .
> So hab' ich dich schon unbedingt . . .

We need not minimize the creative imagination as an inspiration or gift of the gods, to appreciate the importance of well-organized rational routine as the necessary mode whereby our inspiration can find effective expression.

In any case we should not reject the practical claims of rational motives without noting that the worship of reason was a potent influence in minimizing or abolishing age-long abuses like slavery, serfdom, and persecution for witchcraft and heresy. There are not wanting signs that a continued eclipse of the old-fashioned rationalism may bring these abuses back in full force.

There is, of course, no necessary connection between the scientific study of psychology and the vogue of irrationalism. To the extent that it is itself scientific, psychology naturally pursues the rational methods common to all true sciences. Indeed, the modern study of the human mind was largely moulded by the individualistic rationalism typified by Descartes, Hobbes, Leibniz, Wolff, and even, in a measure, Locke, whose French followers were certainly not anti-rationalistic. British associationist psychology, to be sure, always remained extremely nom-

inalistic, that is to say, it so reduced all mental life to separate atomic states as to leave no room for any rational connection. But in its concrete applications, such as in its account of economic and political motives, it long retained the naïve rationalism of the eighteenth century. The great impetus to anti-rationalism in psychology seems primarily due to the great romantic writers, from Rousseau and Novalis to Stendhal and Nietzsche, and to philosophers of the school of Schelling, Schleiermacher, and Schopenhauer. These men, with their fresh and daring vision into the intricacies of the human heart, liberated us from the old over-simple conception of human nature as a logically utilitarian machine. No historian seems to me to have as yet done full justice to the magnitude of the contributions to individual and social psychology due to the romantic school. At the same time it is also true that speculative introspective psychology has largely served as a haven of refuge to those who find the harder facts and the closer and more accurate reasoning of modern physical science uncongenial. Thus it comes to pass that a large part of the idealistic philosophy of the nineteenth century is at bottom hostile to strictly rational procedure, so far as the latter insists on laborious methods to check or prevent the facile confusion between the fanciful world of our heart's desire and the more sober world of actual existence. Hard distinctions and necessary rational order are certainly more easily ignored in speculative psychology than in physics.

Nor is this subjective wilfulness confined to idealism. Positivism, reacting violently against the romantic "rational" or soul psychology, and following the directly opposite route, arrives at strikingly similar results. Thus positivism begins with rejecting the fantastic claims for the creative powers of the mind, and naturally falls into the uncritical worship of "sensations" as the deliverances of the real or external world. This, together with the habit of introspection that stops the processes of thought to see what images exist in the mind, leaves no clue to the rational connectedness of the objective world which science so laboriously seeks. Positivism, therefore, lands us at the conclusion that all logical laws or rational connections of nature are mere fictions or creations of the mind. Thus both romantic idealists and positivists banish rigorous reason as a true integral part of the natural world.

This anti-rationalism common to positivism and to certain forms of

idealism shows itself in the effort to deny the significance of logic by reducing it to psychology. It is, of course, perfectly obvious that no branch of philosophy can hope to attain substantial truth if it ignores or goes counter to the teachings of psychology. But it ought also to be equally obvious that psychology is only one among a number of sciences, that it must take the results of logic and mathematics, physics and physiology for granted, and that the attempt to make psychology identical with the whole field of science or philosophy can lead only to confusion. This is certainly the case when in the interests either of positivism or of psychologic idealism we deny the distinction between logic and psychology. Mr. Schiller has written a whole volume to catalogue what he regards as the absurdities of the traditional logic. To me the greatest absurdity of all is the fundamental premise which Mr. Schiller shares with thinkers as diverse as Mill and (at times) Bradley, viz. that logic should be a description of the way we actually think. Granted that all thinking goes on in individual minds, it does not follow that a psychologic description of reasoning as a mental event can determine whether the resulting conclusion is true. All sorts of variations in imagery or motive may take place in the minds of those who come to the same conclusion as to the multiplication table, but these considerations are irrelevant to the truth or validity of what is asserted. You may, of course, define logic as the psychology of thought and deny the very existence of fallacious thinking by refusing to call it thought; and you may also define functional psychology to include both a description of what goes on in the mind and an evaluation of the truth or the correctness of arguments. But the distinction between the descriptive and the normative points of view is not thereby avoided, though it may be confused by a violent use of terms. A psychologic description of what goes on in my mind as I deal with an ethical or practical problem will not determine the correctness of the solution arrived at; and psychology can no more include the whole of logic and ethics than it can the whole of technology.

§ II. THE ARGUMENT OF HISTORICISM

SIMILAR to the attempt to dispense with reason by reducing everything to the facts of psychology is the attempt to dispense with reason by reducing everything to the facts of history.

The historical studies of the nineteenth century, as is well known, were largely stimulated by the romantic and nationalistic reaction against the cosmopolitanism of the eighteenth century. Hence history became in large measure a basis for attacks on rationalism. Thus no argument is more familiar than that the rationalists of the eighteenth century had a deficient sense of history. They certainly tried to derive the detailed nature of human institutions, such as government or religion, from reasons which seemed plausible a priori, but ignored actual history and the perverse complexity of the facts. We cannot refute this argument by pointing to the great historical work produced by such typical representatives of eighteenth-century rationalism as Voltaire and Gibbon. There really was, in the heyday of the Enlightenment, a great deal of effort to paint the history of mankind on the basis of a priori considerations. It is no denial of this to show that the naturalism of the nineteenth century has produced a great deal more a priori history under the guise of Spencerian evolution, with its sweeping dogma that all peoples and institutions must pass through the same stages of development from the simple to the complex. But it is instructive in passing to call attention to the latter belief as an illustration of crypto-rationalism, i.e. whenever reason is ostentatiously banished through the front door, it is unavowedly or secretly admitted through the back door to perform its necessary functions.

But though in the nineteenth as well as in the eighteenth century thought could not free itself from rationalism and suffered equally from an undue desire to have the world very simple, there are important differences between the conscious pursuit of reason and unavowed or crypto-rationalism. Conscious rationalism starts from the present and is abstract and universalistic. But crypto-rationalistic historicism prefers to start from the exotic and always emphasizes difference and particularism. This can be seen by comparing Gibbon's *Decline and Fall of the Roman Empire* with any typical nineteenth-century history. The figures in

Gibbon, subjects or rulers, are all men and women, enlightened or corrupt, but all capable of stepping out into our own scene and playing their petty or grandiose rôles over again. The sense of differences, such as those between the Romans of the Augustan and of the Byzantine periods, between Lombards and Saracens, is hardly felt. But in rebelling against this conception which makes history somewhat monotonous even in the hands of a master like Gibbon, popular nineteenth-century historicism has undoubtedly exaggerated human differences to the extent of losing sight of our common fundamental humanity. As a result, we have all sorts of wild inhuman interpretations of the motives of ancient and primitive peoples. Even with regard to modern European peoples the mythology of racial souls has obscured the fact that the origin and development of differences in culture can be rationally studied only on the postulate of a common human nature. The practical result of particularism is that while the old rationalistic historians were devoted to the virtue of toleration and the arduous pursuit of enlightenment, the historicism of the nineteenth century was frequently the handmaiden of nationalistic and sectarian claims.

The fact that literary historians are generally more interested in the concrete picture of the events they portray, while scientific physicists are generally more interested in the laws which physical phenomena illustrate, has given rise in recent times to the view that history is nearer to reality, which is always individual, and that rational or scientific physics is a more or less useful fiction. Critical reflection, however, shows that despite differences of subject-matter, the same type of reason underlies scientific history whether human or natural. Hence any successful attack on the truth-value of reason in physics would be fatal to the claims of history.

That all existing beings, animate or inanimate, are individuals no rationalist needs to deny. But that is in no way inconsistent with the fact pointed out by Aristotle that there is no knowledge or significant assertion with reference to any individual, except in terms of universals or abstractions. I may in a dumb way point to a single object or I may grasp it with my hand, but I cannot mean anything and I cannot even say "this" about it without using an abstract term applicable to other individuals. If I use a proper name, it has meaning only by convention which ultimately involves abstract terms. You may pretend to despise

language as much as you please, but if you talk or think at all you cannot consistently deny all significance to that which is expressed in language. The proposition that all reality is individual must not be confused with the proposition that the individual apart from all its abstract determination is the only reality. If what is abstract is unreal, then the detached and characterless individual is the worst of all abstractions, and the most unreal! Moreover, what distinguishes human life and history from merely physical motions is precisely the greater wealth of meaning or significant relations which human objects have in an intelligent view of them. Monuments, coins, and other "remains" are historical only as they point beyond their own present existence. Black marks on paper may mean the right of millions to live or the obligation to give up all their possessions.

So long as this is the case, no historical description or explanation can possibly dispense with abstractions. Consider the description of any historical event whatsoever, e.g. the life or death of Caesar. Can we say that Caesar was rich, profligate, brave, ambitious, or what not, without using abstractions or aspects of life capable of indefinite repetitions? To be sure, the individual man Caesar will never occur again, but all that we know about him depends upon the assumption of certain laws. In this respect human history does not differ from natural history. The geologist as historian of the individual or unique earth of ours is concerned with describing events (like the fusion of certain rocks) which need never occur again any more than some of the revolutions of human history. Indeed, every physicist in the laboratory as well as the engineer engaged in testing a bridge or particular engine is engaged with an individual object. But just as natural history depends upon general physical science, so does human history depend upon and presuppose general knowledge of the laws of human conduct. Take any attempt at historical description or explanation (explanation is but a developed description). We say Caesar was killed because he was ambitious or too generous to his former enemies, and Brutus conspired because he was patriotic or because he was a greedy usurer who could not resist the opportunity to gather the revenues of provinces, etc. Do not these and all other historic explanations assume certain laws or uniformities in human conduct? To be sure, in human history these laws are assumed tacitly, while in natural history they are explicit; and this

is true partly because the laws of physics, dealing with phenomena capable of indefinite repetition, are simpler and more readily verified. But when we see a critical historian engaged in determining whether an alleged fact did or did not take place, his weighing of evidence does not differ in method from that employed in natural science.

Indeed, the facts of history as past cannot be directly observed. They are inferred from monuments, documents, or other present objects which, for certain reasons, we judge to be remains of the past. But from present facts we can conclude as to past facts only if we assume certain universal laws connecting them. The fact that the historian is not always aware of his assumptions or that some things are so constantly taken for granted that there seems no point in mentioning them does not deny their logical necessity. Many of these laws are physical, e.g. that coins or monuments cannot grow naturally but must be made by certain physical processes involving the use of certain materials and tools. Other assumed laws deal with social-psychological elements such as the credibility of witnesses, e.g. that men unconsciously and sometimes deliberately exaggerate their own achievements or those of their country or party and disparage those of their enemies.

Thus the establishment of facts in history, as in courts of law, depends upon both popular assumptions and expert scientific knowledge. We should certainly be critical to the claims that certain eclipses (on which ancient chronology is so often based) can take place only in certain intervals, or to the assertion of certain laws as to the physiology of plants and animals (on the basis of which we conclude that certain regions were depopulated or that certain migrations were botanically necessitated). But if so, how much more critical must we be to "facts" of history that are based on assumed laws of sociology and psychology which have never even been definitely formulated!

The contention of historicism generalized appears as the third argument against rationalism.

§ III. THE ARGUMENT OF EMPIRICISM

THE growth of natural science, with its extensive use of mechanical instruments for observation and experiment, has brought about an impression that science distrusts reason and relies rather on observation and experiment. In proof of the latter it is frequently asserted that the Greeks failed to lay the permanent foundations of science precisely because they were too much addicted to reasoning and did not observe with sufficient care and fulness. Though this assertion has often been repeated by scientists and historians who ought to know better it has no claim to truth. The Greeks were very keen observers precisely because they reasoned clearly and boldly; and it was thus that they did lay the foundations of modern science. The contrary impression that men like Democritus indulged in happy but unverified guesses as to the physical world is not well founded. Democritus was not only a great mathematician, but a list of his works, e.g. "On the Cough which Follows Illness," "On Agriculture," "On Geography," shows that he was certainly not an idle speculator. The Greeks could not have created the science of astronomy and introduced the heliocentric hypothesis if they had not combined very careful observations with rigorous mathematics. It required both to discover the size of the earth's diameter and the precession of the equinoxes, with no better instruments to aid them than the astrolabe. Only a marvellous power of fine observation could, without any clinical thermometer, discover the variations of the temperature curve in various fevers (see the Hippocratic writings). Despite the fashion to abuse Aristotle, it certainly required both active thought and fine observation to discover parthenogenesis and other biologic facts recorded in the writings of Aristotle and of his immediate pupils. The union of clear ideas with accurate observation may also be well illustrated by Xenophanes' noting the impress of fishes in the rocks and boldly concluding that these rocks must at one time have been at the bottom of the sea. If despite that, Greek science did not prosper more, other causes than devotion to reason were responsible.

It is important to press this point because not only among the Greeks but at all times is rigorous reasoning, the essence of mathematics, the necessary condition of accurate and fruitful observation and experiment.

If you had watched the most famous and epoch-making experiments of modern times, e.g. Hertz's on electric waves, or Michelson's on the velocity of light, you might have seen all sorts of apparatus but you could not possibly have observed what these men observed unless you had gone through all the reasoning which these men had gone through before setting up their apparatus. The same is true in principle of almost every observation made today under laboratory conditions. Our fundamental units, light waves, electric current and resistance, rates of metabolism, etc., are never visible except to the eye illumined by all sorts of ideas and rigorous deductions from them. Accidental discoveries of which popular histories of science make mention never happen except to those who have previously devoted a great deal of thought to the matter. Observation unillumined by theoretic reason is sterile. Indeed, without a well-reasoned anticipation or hypothesis of what we expect to find there is no definite object to look for, and no test as to what is relevant to our search. Wisdom does not come to those who gape at nature with an empty head. Fruitful observation depends not as Bacon thought upon the absence of bias or anticipatory ideas, but rather on a logical multiplication of them so that having many possibilities in mind we are better prepared to direct our attention to what others have never thought of as within the field of possibility.

If we thus realize how necessary reason is for the undertaking of scientific observations and experiments, we need not stop to note how necessary it is for the proper interpretation of the results of such experiment and observation. Indeed only theorists utterly ignorant of modern scientific procedure and laboratory practice can ignore the fact that actual observations are often rejected as too improbable and almost always "corrected," i.e. replaced by results that are dictated by the theory of the probable error of observation.[3]

[3] In recent years there has been an impressive increase of interest in the history of science, both in its totality as a human institution and in its special fields; and students of philosophy have much to learn from the works of Duhem, Merz, Lasswitz, Radl, L. Thorndike, Singer, Sudhoff, and Neubauer. Nevertheless we can well say that philosophically the history of science is the least developed branch of history. The bulk of it is still in the annalistic or memoir form. "In the year 1895 Roentgen discovered X-Rays." Such work is indispensable, but hardly constitutes significant history unless the historian has some coherent ideas as to what facts are important for his purpose.

When our historians of science do reflect on these ideas they are for the most part

§ IV. THE ARGUMENT OF KINETICISM

As MATHEMATICS and physics were the first sciences to be developed systematically, rationalism has naturally drawn on them for illustrations of rational truth. The great *éclat*, however, of the doctrine of universal evolution which, as a matter of historic fact, originated more in the romantic philosophy of Schelling than in the biologic observations of Darwin, brought it to the foreground as the popular example of scientific truth. Moreover, the progress of the kinetic theory of matter, the gradual elimination of the inert atom, and the consequent abandonment of Maxwell's view that each individual molecule has remained unaltered since the day of creation, have fortified the impression of universal change. Molecules and atoms, like the hills and the forms of species, have lost their traditional eternity. The sight of so much change where formerly we saw only constancy has produced the dizzy romantic generalization that only change is real and that nature contains no constant elements. Despite the widespread character of this assertion, we need not hesitate to characterize it as a snap judgment resting on no proof of logic or fact. Indeed, how could this universal judgment itself ever be proved by changing empirical facts? Change is doubtless a universal aspect of nature, but so is its correlative constancy. Surface is undoubtedly a universal trait of all physical objects; but any one who argued from this universality to the denial of correlative depth or volume would not be more foolish than one who argues from the universality of change to the denial of constancy. We might as well argue from the universality of death to the absence of life. The truth is simply that there is no change except in reference to something constant. An object, for instance, can be said to move only in so far as it remains the same object and changes its distance from a definite point as measured

dominated by the Voltairean version of the philosophy of the Enlightenment, according to which mankind dwelt in utter scientific darkness, ruled by superstition, theology, and metaphysics, until Bacon, Newton, and Locke came and taught men to observe, calculate, and measure. This view has gained popularity because those who now cultivate a science like physics have not as a rule the historic and philologic training, if they have the interest, to read the older scientists who wrote in a different language and used terms no longer in use. But in recent years, thanks to the labour of men like Duhem and others in ancient, mediaeval, and early Renaissance science, we can see more continuity in the history of science and are in a better position to reflect on its relation to the history of philosophy and of civilization in general.

by some definite unit. Abolish the fixed starting point or goal, the definite direction and the constancy which we call the identity of the object, and nothing is left of the fact of motion. Professor Montague has shown this by asking us to imagine what would become of a race if not only the runners, but the judges, the goal, and the whole track itself, were moving without fixed direction.

Logically, the fact of change or motion is nothing more than the correlation between different moments of time (as determined by some clock) and the different spatial positions of an object. To a creature living entirely in a single moment there is no motion at all. It is only to a being to whom different moments of time are formally present together that motion has a meaning. There is, therefore, nothing paradoxical in saying that the meaning of any motion does not itself move, but is rather a timeless fact or phase of nature. The difficulty in grasping and isolating the timeless or significant aspect of nature is from one point of view simply the difficulty of leaving the ordinary practical interests in the personal possession or manipulation of things, and rising to a reflective insight as to what the world contains. But it may remove needless obstacles to the understanding of this if we insist that the principal difficulty of grasping the nature of universals is the tendency to confuse thoughts with images, and thus reify all objects of discourse. This is shown by the naïve query, "Where are these universals?" (which assumes, of course, that universals are particular things in space). But all truths, even of events in a given place and time (e.g. Caesar's crossing the Rubicon in 49 B.C.), are as truths eternal and independent of spatial location. To argue, as James [4] and others have, that the constant rules of logic cannot be true of a world in flux is a confusion as gross as to argue that motion cannot have a constant velocity or a fixed direction, or that one standing still cannot catch a flying ball. Indeed, are not flux, change, and motion themselves concepts? The Bergson-James argument that all concepts give us only fixed cross-sections of the stream of reality rests at bottom on a confusion between concepts and images—a confusion rendered canonical by the old doctrine of concept as generalized pictures or images. If, however, we examine the actual concepts of science, we find that it is precisely by indicating relations or essential transformations between terms that

[4] *Pluralistic Universe*, pp. 252-253.

they make possible synoptic views of comprehensive changes and enable us to grasp the meaning that change and life have for us. There is no conflict between scientific biology and rationalism.

In the sense in which romanticism denotes distrust of reason, all the foregoing arguments are romantic. But we may regard the last as the essentially romantic one because it makes explicit the romantic impatience with the fixed, clear, and orderly routine of reason, as a restraint on the wish to regard the world as entirely responsive to our fancy and heart's desire. Romanticism, however, is not merely negative. It involves an abounding faith in some inner, creative, and unlimited source of illumination or revelation superior to ordinary reason. Before examining this, however, we may make a few comments on the popular sceptical effort to undermine reason in order to make room for the certainties of faith.

§ V. CAN FAITH BE BASED ON SCEPTICISM AS TO REASON?

IF LOVE is blind, if, where our emotional interests are involved, clear thinking is most difficult, it follows that in matters in which we care most, our thoughts must be full of obstinate confusion and prejudice. The inconsistency of men's professions, as well as the folly of their conduct, bears this out. Historically speaking, few human societies have been interested in matters of belief, and few men care much about intellectual consistency for its own sake. Most men have little more inclination to examine the foundations of their beliefs than trees have to bring their roots to the sunlight.

When, however, we meet those whose conduct and professed beliefs are markedly different from ours, our own accustomed standards are challenged, and we become concerned. In our irritated reaction we may turn away in loathing, or try to exterminate the strange abomination. But when a régime of outer toleration of differences is established, men must intellectually adjust themselves in some way. One easy way is to hold on to your own traditional practice and to minimize the importance of these differences. It then becomes "bad form" to argue matters of religion. In the fashionable theory all good men are religious. Let each worship according to the religion of his father, or as his conscience

dictates. But the exercise of unqualified freedom of conscience would bring the practitioner into conflict with the established social order. Another adjustment to the diversity of faiths is to despise contrary beliefs as not held by the proper people. Certain views are ruled out of discussion because they are held only by infidels, bolsheviks, stuck-in-the-mud conservatives, reactionaries, etc.

But in a heterogeneous society men cannot altogether escape the challenge to give reasons for the inherited faith within them. Out of the difficulties of meeting this challenge arises the doctrine of faith and of the right to believe what we wish to believe. Now a resolution not to reason is as insusceptible to logical refutation as is a resolution not to sing in public. To realize the limits of our inclinations and aptitudes in these respects is, indeed, admirable. But men who will not give the reason for their faith are not always modest. They try to save their own prestige by condemning the whole enterprise of reason, and this they do by professing scepticism as to the value of reason. But in a world of conflicting faith scepticism lends no permanent support to any creed against its destructive rivals, and a faith that becomes aware of its impotence is on the decline. Hence the poet who sings that "by faith and faith alone" we grasp the truth, finally puts it, "I will dream my dream and hold it true." [5]

This right to believe has been defended by William James on the ground that since we must take risks in life, we have a right to believe those things that we believe may help us to attain our vital interests. Assuredly, every one does risk his life on his fundamental beliefs. But this does not prove them true, or even dispose of the doubts raised by those who actually challenge the beliefs. We cannot by the will to believe in a personal God make Him come into existence. We cannot by believing it even add a cubit unto our own stature. Reason in the form of logical science is an effort to determine the weight of evidence. To tip the scales by the will to believe is childish foolishness, since the real weight of things is not thereby changed.

In defence of the view that by the exercise of the will to believe we may influence the facts believed it has been urged that pessimism may shorten our life, and optimism may lengthen it. I can see no evidence for this claim, and it is inherently doubtful whether a resolution to see

[5] If I know it is a willed dream, how can I believe it to be true?

the sunny side of life is more effective than other resolutions. Life in a fool's paradise does not last long. In the end the will to believe is as inimical to a healthy, aggressive faith which seeks to convince our fellows, as it is corrupting to our own intellectual integrity. The force of this is seen in the fact that the Catholic Church, whose worldly wisdom few question, has persistently condemned Fideism.